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10/091,035	03/06/2002	William Vann Hasty JR.	43240	6469

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EXAMINER	
PHAN, MAN U	

ART UNIT	PAPER NUMBER
2665	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/091,035	Applicant(s) HASTY ET AL.	
	Examiner Man Phan	Art Unit 2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-17,19-28 and 30-51* is/are rejected.

7)☒ Claim(s) *7,18 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Response to Amendment and Argument

1. This communication is in response to applicant's 08/30/2004 Amendment in the application of Hasty, Jr. et al. for a "System and method for using per-packet receive signal strength indication and transmit power levels to compute path loss for a link for use in layer II routing in a wireless communication network" filed 03/06/2002. The proposed amendment to and response have been entered and made of record. Claims 1-51 are pending in the present application.

2. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.

3. In response to Applicant's argument that there is no suggestion to combine the references, i.e., Toh and Haartsen as proposed in the office action. The Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of

ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). It must be recognized that any judgement on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. *In re McLaughlin*, 443, F.2d 1392; 170 USPQ 209 (CCPA 1971).

4. Applicant's argument with respect to the rejected claims 1, 12 and 23 (page 2, third paragraph) that the cited references do not disclose the "*link quality value assigned to a communication link*". However, Toh (US#5,987,011) is applied herein merely for the teaching of a novel routing method specifically adapted for use with *ad-hoc mobile networks* and more particularly to a routing method where communications between source and destination mobile hosts is carried out across a conference *size packet* radio network of mobile hosts, in which the stability of routes through *an ad-hoc mobile communications* network is measured (*evaluating link quality value*) using an associativity characteristic and selection of a particular route for transmission of information is based on that particular route's stability (*link quality value*)(Col. 3, lines 25-30). For example, the present ABR protocol considers routes with the highest degree of association stability (*link quality value*) and acceptable route relaying load as the most important *quality of service metrics*, followed by minimum-hop routes and routes with minimum cumulative forwarding delay (Col. 20, lines 13 plus). Furthermore, Haartsen (US#5,864,413) discloses a method for dynamically allocating channels in a communication system which maximizes system capacity while minimizing the transmitted power of the mobile

radiotelephones *in determining link quality*. The control scheme presented herein adapts to the current traffic and interference situation in a communication environment in order to *optimize the quality of each link and maximize the overall system capacity*. The status of the current traffic and interference condition is derived from measurements taken both by the mobile station and the base station. The channel allocations are periodically updated to ensure that, on average, the least amount of *transmit power* is used on the channels. Once a channel has been allocated, the adaptive power control scheme tries to maintain a *satisfactory link quality with the minimum amount of radiated power* (Col. 3, lines 35 plus).

Applicant further alleges that the cited references does not teach or suggest the signals are transmitted in data packet format, and the use of RSSI (pages 8, 9, last paragraphs), and an ad-hoc wireless communication network, 802.11 type network (page 9, second paragraph). However, Toh discloses a routing method, where each packet carries sufficient routing information for it to arrive at the destination (Col. 1, lines 62 plus). Furthermore, Toh's invention adapted for use with *ad-hoc mobile networks* and more particularly to a routing method where communications between source and destination mobile hosts is carried out across a conference size *packet radio network* of mobile hosts (Col. 2, lines 5 plus). In the same field of endeavor, Haartsen discloses to channel allocation combined with power control in a mobile radio communication system. The RSSI measurements can now be used to calculate the path losses between the base stations whose signals were measured and the mobile station performing the measurements. The RSSI measurement together with the base transmit power (which is either fixed, or otherwise known by the network 300 and reported to the base station controller of base station A) provide all the information required to calculate the signal path loss (PL) for each

signal. Path loss, calculated as the RSSI divided by the base transmit power, is an expression of the attenuation that a signal will experience as it propagates between the base station and the mobile station. For example, assume that mobile station A has measured the RSSI of signal 315 broadcast from base station C to be -125 dBm. It is also known that signal 315 is broadcast at a power level of 0 dBm. Therefore, the calculation of path loss is straightforward (Col. 7, lines 5 plus). Therefore, the Examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC ' 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35

U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-6, 11-17 and 22-28, 33-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toh (US#5,987,011) in view of Haartsen (US#5,491,837).

With respect to claims 1-6, 11 and 34-39, both Toh (US#5,987,011) and Haartsen (US#5,491,837) disclose a novel system for determining the link quality in wireless communication utilizing RSSI and TPL of the data packet, according to the essential features of the claims. Toh (US#5,987,011) discloses a routing method for supporting ad-hoc mobile communications within a radio communications network. The network comprises a plurality of mobile hosts including a source mobile host and a destination mobile host, and a plurality of radio communications links connecting together with mobile hosts. The method comprises measuring the stability of the communications links between neighbouring mobile hosts using an associativity based characteristic and selecting a communications route through the network from the source mobile host to the destination mobile host based on the stability of the communications links. The associativity characteristic is measured by each mobile host periodically transmitting and receiving identifier beacons (ticks) and updating the status of its corresponding links. The greater the number of ticks associated with a given link, the greater its stability. Use of the associativity characteristic enables the routing method to deal efficiently with mobile host migrations throughout the network (Col. 3, lines 25 plus and Col. 21, lines 18 plus).

However, Toh does not disclose expressly the received sensitivity and received signal strength indication values received at the data packet, and provided by the network. In the same

field of endeavor, Haartsen (US#5,491,837) discloses a method for dynamically allocating channels in a communication system which maximizes system capacity and link quality while minimizing the transmitted power of the mobile radiotelephones. Haartsen teaches in Figs. 5 & 6 flow charts illustrated the uplink and downlink allocation of channels within a radio communication system, specifically a cellular network which comprising the steps of: (a) measuring, in a mobile station, received signal strength indications (RSSIs) of control signals broadcast from at least one base station; (b) determining a path loss between the mobile station and the at least one base station using the RSSI measurements; 8 measuring, in the at least one base station, an RSSI of interference signals on a plurality of available traffic channels; (d) determining transmit powers required for the mobile station to produce a signal on each of the plurality of available traffic channels at the at least one base station, wherein a strength of the signal is a predetermined level above a corresponding RSSI interference level measured on a traffic channel taking into consideration the path loss; and (e) assigning one of the plurality of available traffic channels as an uplink channel based on the determined transmit powers (TPL) (Col. 7, lines 5 plus and Col. 19, lines 28 plus).

Regarding claims 12-17, 22 and 40-45, they are method claims corresponding to the apparatus claims 1-6, 11 and 34-39 above. Therefore, claims 12-17, 22 and 40-45 are analyzed and rejected as previously discussed with respect to claims 1-6, 11 & 34-39.

With respect to claims 23-28, 33 & 46-51, these claims differ from claims Toh in view of Haartsen in that the claims recited a computer program product for performing the same basis of steps and apparatus of the prior arts as discussed in the rejection of claims 1-6, 11, 34-39 and 12-17, 22, 40-45 above. It would have been obvious to a person of ordinary skill in the art to

implement a computer program product in Toh in view of Haartsen for performing the steps and apparatus as recited in the claims with the motivation being to provide the efficient enhancement to the link quality determination in a wireless communication network, and easy to maintenance, upgrade.

One skilled in the art would have recognized the need for effectively and efficiently determining the integrity of a link for use in layer II routing, and would have applied Haartsen's assigning uplink and downlink radio channels utilizing RSSI and TPL into Toh's novel routing method where communications between source and destination mobile hosts is carried out across a conference size packet radio network of mobile hosts. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Haartsen's method and system for channel allocation using power control and mobile assisted handover measurements into Toh's routing method for ad-hoc mobile networks with the motivation being to provide a method and system for using per-packet RSSI and TPL to compute path loss for a link for use in layer II routing in a wireless communication network.

7. Claims 8-10, 19-21 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toh (US#5,987,011) in view of Haartsen (US#5,491,837) as applied to claims above, and further in view of Okanoue (US#6,307,843).

With respect to claims 8-10, Toh and Haartsen disclose the claimed limitations discussed in paragraph 8 above. In the same field of endeavor, Okanoue (US#6,307,843) provides an ad-hoc network of mobile hosts interconnectable by a number of wireless links, each mobile host includes a link table having a multiple entries each comprising a host name, a link identifier

indicating one of the wireless links, a network layer address and a data link layer address. Each of the mobile hosts comprises a link table having a plurality of entries each comprising a host name, a link identifier indicating one of the wireless links, a network layer address and a data link layer address. Each mobile host is responsive to an entered destination host name for making a search through the link table, transmitting a frame containing the network layer and data link layer addresses of an entry of the link table on one of the wireless links which is indicated by the link identifier of this entry if this entry contains the destination host name. If the link table does not contain the destination host name, the mobile host scans the wireless links, broadcasts a link table request message on one of the scanned wireless links, receives a remote link table containing the destination host name, and transmits a frame containing network layer and data link layer addresses of the received link table on the wireless link on which the remote link table was received (See Figs 1, 2; Col. 1, lines 44 plus).

One skilled in the art would have recognized the need for effectively and efficiently determining the integrity of a link for use in layer II routing, and would have applied Okanoue's ad hoc network in which mobile hosts are connected to each other via direct wireless links, and Haartsen's assigning uplink and downlink radio channels utilizing RSSI and TPL into Toh's novel routing method where communications between source and destination mobile hosts is carried out across a conference size packet radio network of mobile hosts. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Okanoue's ad hoc network of mobile hosts using link table for identifying wireless links and destination addresses, Haartsen's method and system for channel allocation using power control and mobile assisted handover measurements into Toh's routing method for ad-hoc

mobile networks with the motivation being to provide a method and system for using per-packet RSSI and TPL to compute path loss for a link for use in layer II routing in a wireless communication network.

Allowable Subject Matter

8. Claims 7, 18 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest the specific equation for calculating the link quality ratio as expressly recited in claims 7, 18 and 29.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Edwards et al. (US#2004/0059825) is cited to show the medium access control in a wireless network.

The Reidi et al. (US#2002/0071395) is cited to show the mechanism for performing energy-based routing in wireless networks.

The Apostolides et al. (US#6,829,226) is cited to show power control for a mobile

terminal in a satellite communication system.

The Whitehead (US#5,732,077) is cited to show resource allocation system for wirerless networks.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION THIS ACTION IS MADE FINAL**. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149. The examiner can normally be reached on Mon - Fri from 6:00 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

Mphan

01/05/2005.

Man U. Phan

MAN U. PHAN
PRIMARY EXAMINER